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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,580	09/05/2006	Takuo Watanabe	358682001300	6245
25227 7590 01/09/2008 MORRISON & FOERSTER LLP 1650 TYSONS BOULEVARD SUITE 400 MCLEAN, VA 22102			EXAMINER JACKSON, MONIQUE R	
			ART UNIT 1794	PAPER NUMBER
			MAIL DATE 01/09/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/591,580

**Applicant(s)**

WATANABE ET AL.

**Examiner**

Monique R. Jackson

**Art Unit**

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 12/06.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_.

### DETAILED ACTION

1. Claims 16 and 17 are objected to because of the following informalities: the claims include the term "layer(s) layer". Appropriate correction is required.

#### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al (USPN 4,937,133.) Watanabe et al teaches a double-sided metal/polyimide laminate comprising a low thermal expansion polyimide, a high thermal expansion polyimide, and a conductor such as copper wherein the low thermal expansion polyimide has a coefficient of linear expansion of  $(0-19) \times 10^{-6}/K$  and are formed from dianhydrides and diamines, and mixtures thereof, that that read upon those claimed, and would inherently result in glass transition temperatures as claimed, and wherein the high thermal expansion polyimide has a higher thermal expansion than the low thermal polyimide, preferably  $5 \times 10^{-6}/K$  or more, or preferably  $10 \times 10^{-6}/K$  or more than the low thermal expansion coefficient (Abstract; Col. 2-4; Col. 6, lines 37-43; Examples.) The high thermal expansion polyimide resin has no restrictions other than being higher than that of the polyimide resin of the low thermal expansion, but it is preferably  $20 \times 10^{-6}/K$  or more, and preferably has a glass transition temperature of less than  $350^{\circ}C$  (Col. 3, lines 56-68.) Watanabe et al further teach that an additional low thermal expansion polyimide layer may be provided or a second low thermal expansion polyimide layer having a thermal expansion higher than the first

low thermal expansion layer may be provided in the laminate as well as an additional high thermal expansion polyimide layer in various orders that read upon the claimed laminate (Col. 6.) Watanabe also teaches that the laminate can be formed by a process as instantly claimed wherein the precursors solutions are sequentially or simultaneously applied to a metal foil, such as a copper foil, and then subjected to heat treatment (Col. 6, Examples.) Watanabe et al teach that the polyimide resins differing in linear expansion coefficient are put together to form a composite insulator wherein the thickness of the high thermal expansion ( $t_1$ ) and the thickness of the low thermal expansion ( $t_2$ ) are desirably controlled so as to obtain a ratio of 0.01 to 20,000, preferably 2 to 100, or more preferably 3 to 25 (Col. 5, lines 43-55.) Watanabe et al further teach that the precursor solution may also comprise epoxy resins (Col. 5.)

4. Claims 1-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi et al (USPN 6,346,298) Takahashi et al teach a flexible board comprises metal foil 1, such as a copper foil, and provided thereon a laminated polyimide-based resin layer 2 of a three-layer structure comprising a first polyimide-based resin layer 2a, a second polyimide-based resin layer 2b, and a third polyimide-based resin layer 2c, wherein the following equation is satisfied:  $k_1 > k_3 > k_2$ ; where  $k_1$  is the coefficient of linear thermal expansion of the first polyimide-based resin layer 2a on the side of the metal foil 1,  $k_2$  is the coefficient of linear thermal expansion of the second polyimide-based resin layer 2b, and  $k_3$  is the coefficient of linear thermal expansion of the third polyimide-based resin layer 2 (Abstract; Col. 6, lines 36-42.) Takahashi et al teach that the  $k_1$  is preferably  $20 \times 10^{-6}/K$  or higher (reads upon the claimed “second low” or the claimed “high”;  $k_2$  is preferably  $(10 \text{ to } 25) \times 10^{-6}/K$ ; and  $k_3$  is such that the difference between  $k_1 - k_2$  may be confined preferably to  $5 \times 10^{-6}/K$ , more preferably  $3 \times 10^{-6}/K$ ; wherein the layer

thickness are such that they have a thickness ratio that would fall within 0.01-100 (Col. 3-6.) Takahashi et al further teach that the polyimide resin can be produced from diamine and dianhydrides as instantly claimed and would inherently have glass transition temperatures as claimed (Col. 3-4.) Takahashi et al also teach that an epoxy resin may be added to the first, second and their polyimide resins (Col. 6, lines 30-35.)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monique R. Jackson whose telephone number is 571-272-1508. The examiner can normally be reached on Mondays-Thursdays, 10:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Monique R. Jackson  
Primary Examiner  
Technology Center 1700  
January 6, 2008